

The Medical Management of Chemical and Biological Casualties Video Course Comprehensive Final Exam

Following are 40 questions regarding the medical management of biological and chemical casualties. Please read each question thoroughly and mark the answer ***on your answer sheet only*** that is the MOST appropriate choice.

1. The clinical manifestations of Venezuelan Equine Encephalitis can consist of the following:

- a. A benign influenza-like illness
- b. A severe febrile encephalitis with a 20% fatality rate
- c. A febrile illness consisting of headaches, myalgias, vomiting, diarrhea, and lethargy which lasts 3-5 days and has an overall case fatality rate of less than 1%
- d. All of the above

2. The biological warfare agent that the United States is most concerned that Saddam Hussein might use against our troops in the Persian Gulf is:

- a. Clostridium botulinum
- b. Vibrio cholerae
- c. Yersinia pestis
- d. Bacillus anthracis
- e. Francisella tularensis

3. The following measures were instituted to protect our troops in the Persian Gulf against weaponized *Bacillus anthracis* during the Gulf War:

- a. Ciprofloxacin in a 5-day blister pack was issued to each soldier to begin taking immediately after exposure and was to be continued for 30 days if a true exposure occurred
- b. Soldiers deemed to be at highest risk of exposure were given two doses of the licensed vaccine two weeks apart early in January 1991
- c. All soldiers in the theater would have eventually received three doses of the licensed vaccine, as more was made, if the conflict had continued for several months
- d. All of the above

4. The biological threat agent with the potential for producing the greatest number of deaths in a battlefield field environment is:

- a. Q Fever
- b. Tularemia
- c. Anthrax
- d. Staphylococcal Enterotoxin B

5. In the event of a biological agent attack, the impact on the health care system would most likely include all except:

- a. Fear and potentially panic
- b. Overwhelming casualty numbers
- c. Overwhelming demand for intensive care modalities
- d. High potential for patient to provider spread of the disease agent

6. The single greatest risk for medical staff caring for Viral Hemorrhagic Fever patients is:

- a. Small-particle aerosols generated from pulmonary secretions
- b. Small-particle aerosols resulting from arterial blood shed at high pressure
- c. Droplets that may deposit on conjunctivae
- d. Needle-stick injuries
- e. Acquiring illness from same vector/reservoir that infected the patient

7. Vaccines that could be useful in protecting military personnel exist for all of the following hemorrhagic fever viruses except:

- a. Argentine hemorrhagic fever
- b. Rift Valley fever
- c. Yellow fever
- d. Ebola virus

8. Which is not correct of biological toxins:

- a. Can easily defeat the protective mask
- b. Not easily absorbed through the skin
- c. Some are more toxic than the classical chemical agents
- d. As a group the toxins have numerous mechanisms of action

9. Ricin:

- a. Is produced by a sea snail
- b. Causes different lesions intravenously than by inhalation
- c. Is much more lethal than the botulinum toxin
- d. Precursor materials are scarce in tropical areas of the world

10. Which of the following is false regarding treatment of plague:

- a. Chloramphenicol is the first drug of choice used to treat plague meningitis
- b. Face-to-face contacts of pneumonic plague victims should be given prophylaxis with a tetracycline
- c. Emergence of antibiotic-resistant Yersinia pestis is a common problem in the treatment of plague
- d. Streptomycin is the drug of choice for treating both bubonic and pneumonic plague
- e. Both A and C

11. Plague Vaccine, USP:

- a. Is a live-attenuated whole-cell preparation yielding life-long protection via a single inoculation
- b. Is proven to be effective in immunizing and protecting troops for rapid deployment (within one month)
- c. Is virtually unchanged since its development 50 years ago
- d. Is a component vaccine made with recombinant DNA technology

12. The most effective particle size range of an infectious aerosol is:

- a. Less than one micron
- b. One to five microns
- c. Seven to twelve microns
- d. Greater than 20 microns

13. The best time for disseminating an effective aerosol is:

- a. Just before sunrise, dusk, or at night
- b. During daylight in order to maximize the number of people outside of their homes and buildings
- c. When the wind is blowing 20-30 mph in order to quickly and effectively distribute the infectious aerosol
- d. None of the above

14. All of the following statements regarding Q fever are true, except:

- a. Infection may be initiated by as few as 10 organisms
- b. The incubation period is constant, regardless of whether the infecting inoculum is large or small
- c. The signs and symptoms of Q fever are non-specific, so the diagnosis requires a high index of suspicion and/or compatible epidemiological history
- d. Administration of the vaccine should be preceded by a skin test

15. Most BW agents produce sufficiently distinct clinical signs that a health care provider could make a reasonable clinical assessment without laboratory support.

- a. True
- b. False

16. Patients with illnesses due to most biological warfare agents can be safely cared for using Standard Precautions (gown, gloves, surgical masks, eye protection).

- a. True
- b. False

17. How may Investigational New Drugs (Vaccines) be administered according to FDA regulation:

- a. They may be given as any other drug is given
- b. They must be given under protocol with informed consent
- c. They may be given under a protocol but informed consent is not required
- d. They may be given by the military as any other drug is given but must be given to the general public under protocol and informed consent

18. Tularemia is considered a possible aerosol agent because:

- a. It requires a low infecting dose
- b. It causes a severe febrile illness with up to 30% mortality
- c. It resists all known antibiotics
- d. All vaccines are ineffective against it
- e. Both A and B are correct

19. The lethal effects of inhalational anthrax occur primarily in which of the following anatomic sites:

- a. Lungs
- b. Kidneys
- c. Mediastinum
- d. Brain

20. An epidemic is likely to be a biological warfare attack if:

- a. There are a record number of cases and a high attack rate
- b. A low number of cases and a 100% attack rate
- c. Two or more unusual diseases occur in an area in a combined epidemic
- d. Both A and C are correct

21. Which of the following is true concerning LD₅₀, the Ct product, and LCt₅₀?

- a. They estimate the amount of agent with a 50% chance of killing an individual
- b. Effects from a given Ct product are essentially unaffected by rate and depth of breathing
- c. Both LD₅₀ and LCt₅₀ estimate how much agent would kill 50% of an exposed group
- d. As the LD₅₀ and LCt₅₀ get smaller, the agent potency (toxicity) decreases as well
- e. The LCt₅₀ of mustard is greater than the average LCt₅₀ of cyanide

22. Of the following, the earliest indicator of pulmonary edema in a casualty exposed to a respiratory agent is:

- a. an abnormal arterial-blood-gas (ABG) test
- b. dyspnea (shortness of breath)
- c. a pattern of scattered infiltrates with Kerley B lines on PA and lateral chest radiographs
- d. dullness to percussion on physical examination.
- e. wheezing

23. Which of the following is true concerning cyanide?

- a. A dependable warning of the presence of AC is its characteristic odor of bitter almonds
- b. As a blood agent, cyanide binds avidly to the oxyhemoglobin in blood
- c. Cyanide reacts strongly with certain transitional metals and with sulfur donors
- d. Because cyanide prevents cellular utilization of oxygen, supplemental oxygen is not indicated
- e. Once breathing has stopped, a cyanide casualty should be triaged as expectant

24. In a person severely intoxicated by nerve agent, atropine administration should be titrated to which of the following?

- a. Clinical reduction of bronchospasm and secretions
- b. Clinical restoration of normal heart rate and blood pressure
- c. Clinical reduction of skeletal-muscle fasciculations and twitching
- d. Clinical reduction of gastrointestinal distress and spasm
- e. Clinical resolution of miosis and eye pain

25. Differences between sulfur mustard and Lewisite include which of the following?

- a. Mustard patients usually need more vigorous fluid resuscitation than do Lewisite patients
- b. Lewisite is approximately 5 to 8 times more toxic than is sulfur mustard
- c. The latent period of Lewisite is longer than that of sulfur mustard
- d. Pulmonary edema is more likely with Lewisite than with sulfur mustard
- e. Lewisite has a higher boiling point than does sulfur mustard

26. It is important to decide whether agent exposure is to vapor or to liquid because:

- a. only vapors produce eye effects
- b. the strength of bleach chosen depends upon whether the agent is a vapor or a liquid
- c. clinical effects from liquid exposure may be delayed
- d. wearing the mask may not be necessary if the agent is liquid
- e. diazepam is not indicated for exposure to nerve-agent vapor

27. Which of the following is true concerning peripherally acting pulmonary agents?

- a. Symptoms never precede signs
- b. They cause clinical effects that mimic adult respiratory distress syndrome (ARDS)
- c. Irritation of the nose and mouth with coughing and bronchospasm effectively excludes these agents
- d. Their peripheral effects are probably caused by hydrochloric acid
- e. In most cases, prophylactic administration of antibiotics is a reasonable medical option

28. The M256 detector ticket will detect vapors of which of the following?

- a. Nerve agents and cyanide only
- b. Nerve, cyanide, and vesicant agents
- c. Cyanide, mustard, and only the G nerve agents
- d. Vesicants and nerve agents only
- e. None of the above

29. For a casualty exposed on the skin to liquid mustard two hours ago, skin decontamination:

- a. should be omitted, since the damage occurred during the first two to five minutes
- b. should be done using 5% instead of 0.5% hypochlorite
- c. should be done only to protect health-care workers
- d. should be done to inactivate mustard in blisters, since mustard in fluid is very persistent
- e. should be done to protect the patient from continuing exposure and to protect health-care workers

30. Which of the following is true about incapacitating agents?

- a. The agent once weaponized by the U.S. was a highly persistent liquid
- b. Bradycardia (heart rate "slow as a snail") is one of the characteristic presenting signs
- c. Classic central-nervous-system effects include abstract geometric hallucinations
- d. Administration of a specific antidote is almost always indicated in confused or combative casualties
- e. Iraq is suspected of having stockpiled large amounts of one of these agents in the 1980s.

31. Which of the following is the standard U.S. military treatment for cyanide poisoning on the battlefield?

- a. Sodium nitrate followed by sodium thiosulfite
- b. Amyl nitrite followed by sodium nitrate and then sodium thiosulfite
- c. 100% oxygen administered concomitantly with sodium thiosulfate
- d. Sodium nitrite, sodium thiosulfite, and diazepam
- e. Sodium nitrite and sodium thiosulfate

32. Someone with severe systemic effects from a nerve agent should initially receive:

- a. Three MARK I kits (NAAKs)
- b. Diazepam (CANA)
- c. Three MARK I kits (NAAKs) and diazepam (CANA)
- d. One MARK I kit (NAAK)
- e. Three Mark I kits (NAAKs) and an additional 2 mg of atropine

33. Which of the following statements concerning sulfur mustard is true?

- a. Mustard is a recognized carcinogen
- b. Body surface area involved with skin burns is highly correlated with mortality
- c. Mustard dissolves quickly in aqueous solutions such as sweat
- d. Hands were among the body sites most frequently burned by mustard in World War I
- e. Mustard penetrates skin rapidly but typically takes several hours to damage skin cells

34. The M40 protective mask with its C2A1 canister:

- a. Depends upon a HEPA particulate filter as a barrier to cyanide, G agents, and phosgene
- b. Will protect the wearer against carbon monoxide and low concentrations of oxygen
- c. Is to be donned, cleared, and checked in up to 15 seconds
- d. Uses zinc-impregnated charcoal to adsorb molecules of chemical-agent vapor and gas
- e. Is only rarely associated with increased work of breathing and shortness of breath

35. Central effects differ from peripheral effects in that central effects:

- a. Seldom exhibit a latent period
- b. Do not usually result from exposure to phosgene or PFIB
- c. Should be suspected when a casualty reports being short of breath
- d. Cause gurgling from pulmonary-edema fluid rising in the airways
- e. Usually produce noise from turbulent airflow

36. At a battalion aid station (BAS), a casualty who was exposed 30 minutes ago to nerve-agent vapor and liquid and who is now reporting mild dyspnea (which is resolving) should be triaged as:

- a. urgent
- b. immediate
- c. delayed
- d. minimal
- e. expectant

37. Pre-exposure administration of pyridostigmine bromide:

- a. is given when ordered by the senior medical officer in the division
- b. is given to create a "reserve force" of protected AChE
- c. is most appropriate when the threat agent is known to be GF
- d. is associated with a high incidence of debilitating side effects
- e. increases survival even when antidotes are not given after nerve-agent exposure

38. Effects after cyanide inhalation typically include which of the following?

- a. Miosis, bronchial hypersecretion, and nausea
- b. Brief hyperventilation and initial increases in heart rate and blood pressure
- c. Convulsions, vomiting, and flaccid paralysis
- d. Muscle weakness, cyanosis, and secretions
- e. Sudden loss of consciousness after a latent period of up to 60 minutes

39. A specific antidote for incapacitating agents is:

- a. neostigmine
- b. pyridostigmine
- c. physostigmine
- d. pralidoxime
- e. none of the above

40. The clean treatment area should be:

- a. upwind from the area of contamination
- b. downwind from contamination in order to take advantage of detector systems in place
- c. uncovered whenever possible to prevent dripping of agent from overhead cover
- d. downwind from the PDS
- e. as close as possible to the hot line

I certify that I have completed this educational activity and post-test.

Physician's Name